



A Quality and Technology Network

The Introduction of Lead-Free Soldering in the Portuguese Electrical and Electronic Industries – an Overview Status

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Cape Canaveral, 22-23 of September 2004*

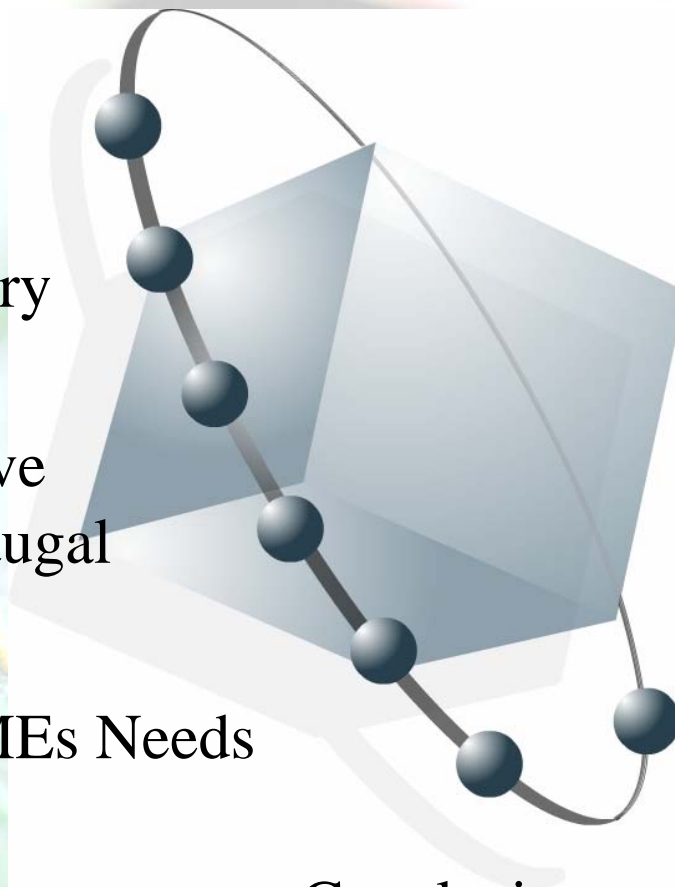
Agenda

Portuguese
Electric &
Electronic Industry

RoHS Directive
Impact in Portugal

SMEs Needs

Conclusions



Portuguese Electric & Electronic Industry

ANIMEE – Portuguese Association of
Manufacturers of Electric and Electronic Equipment

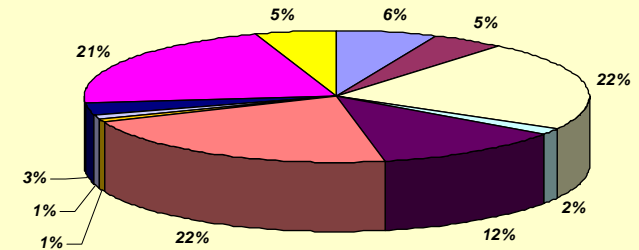
Universe : 115 industrial companies (from a total of 200)

Electrical Equipment and Energy

Electronics and Information Technology

Telecommunications and Medical Imaging

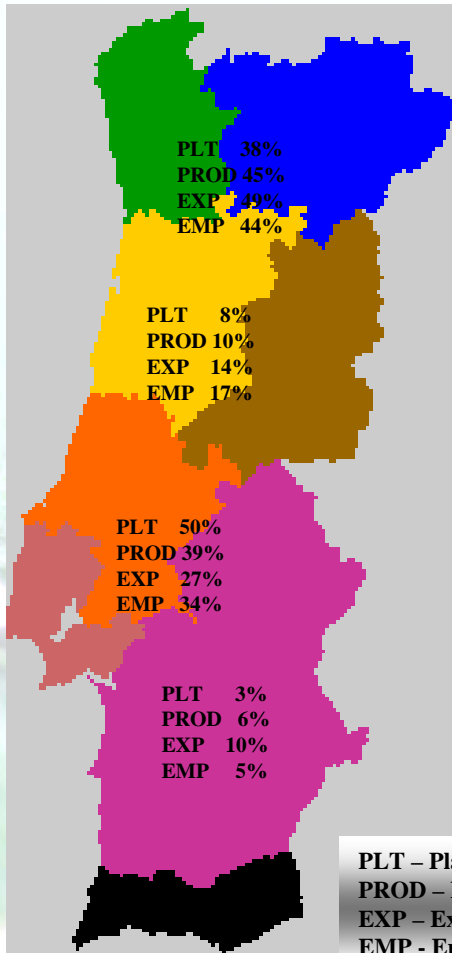
Consumer Electrical and Electronic
Equipment



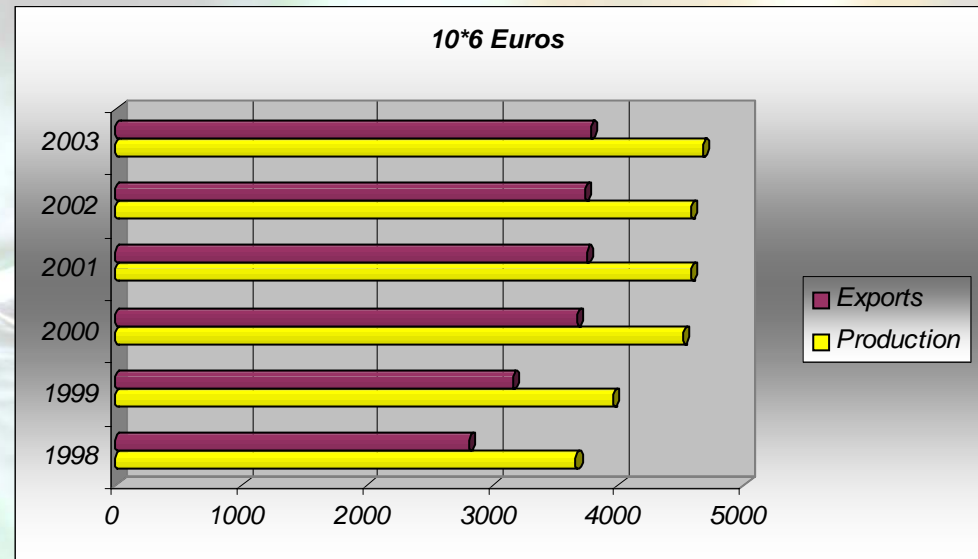
- Electric Equipment (1)
- Wires & Cables
- Wiring harnesses
- Automation, Control and Measuring Equipment
- Telecommunications, Informatics, Prof. Electronics
- Electronic Components
- Accumulators and Cells
- Lamps and Lighting Fittings
- Electric Installation Apparatus
- Consumer Electronics
- Household Appliances



Portuguese Electric & Electronic Industry



Market Evolution



Portuguese Electric & Electronic Industry

<i>Exports Top Ten Countries</i>		<i>Top Ten Exported Products</i>
<i>Country</i>	<i>%</i>	
Germany	34	Wiring Harnesses
Spain	13	Car Radios
United Kingdom	9	Semiconductors – Memories
United States	9	Electronic Ass. for DP Equipment
France	8	Tantalum Capacitors
Belgium	6	Relays
Italy	4	Transformers
Netherlands	2	Liquid Immersed Transformers
Angola	2	TV cameras
Hungary	1	Mobile phones
Others	12	



Portuguese SMEs Universe

EU SMEs Definition: (1)

Turnover : up to 50 MEuros

Staff: up to 250 employees

<i>Range of Production (Million of Euros)</i>	<i>Number of Companies</i>	<i>Employment Brackets (number of employees)</i>	<i>Number of Companies</i>
Up to 1,25	24	Up to 50	52
From more than 1,25 to 5	28	From 51 to 100	14
From more than 5 to 12,5	16	From 101 to 400	29
From more than 12,5 to 25	15	From 401 to 1000	9
From more than 25 top 50	8	More than 1000	11
From more than 50 to 100	10		
more than 100	14		
	115	TOTAL	115

(1) EC Recommendation 2003/361/EC



Current Needs of SMEs

- *Lead Free soldering implementation*
 - New Fluxes and adequate solder pastes
 - New or refurbishment equipments
 - Adequate process windows
 - Inspection and quality assurance policy
 - Standardisation
 - Qualification and training




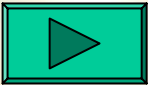

Technical support to SMEs

- ISQ strong involvement in the implementation of LFS in Portugal
 - ANIMEE close collaboration
 - C3P : Lead-Free Project
 - ELFNET European Network
 - LEADOUT Project
 - Direct Industrial services (*Consultancy and testing*)



Current Needs of SMEs

MAIN CONCERNS

- **ALLOY SELECTION AND BOARD FINISH** 
- **COST** (*Solders, Equipment, process setup, defect rates...*) 
- **LEAD-FREE COMPONENTS AVAILABILITY**
- **REABILITY ASSURANCE OF LEAD-FREE PRODUCTS**
- **STAFF TRAINING** 



National Strategic Objectives to Support SMES

- Development/implementation of low cost lead-free soldering processes to support Portuguese SMEs in meet the EU directives (WEEE and RoHS)
- Establishment of process quality standards, reduce of defect rates, improve reliability and therefore competitiveness
- Improve Health and Safety awareness and pollution prevention
- Training



Conclusions

The Electric and Electronic Market in Portugal is growing

LFS implementation on-going in large companies and starting in SMEs

Awareness and technical support to industry in order to achieve a on-time LFS implementation is required

R&D organisations plays an important role in the LFS implementation in industry

More than a pollution prevention objective LFS should be faced
As a goal to increase European Compettiveness within the
Electric and Electronic Sector



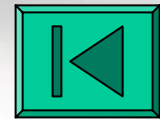


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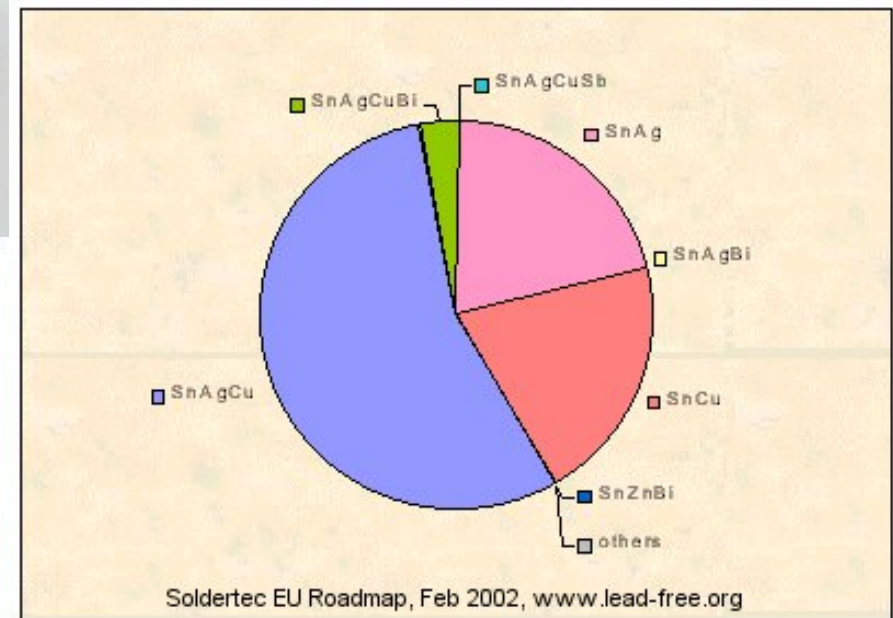
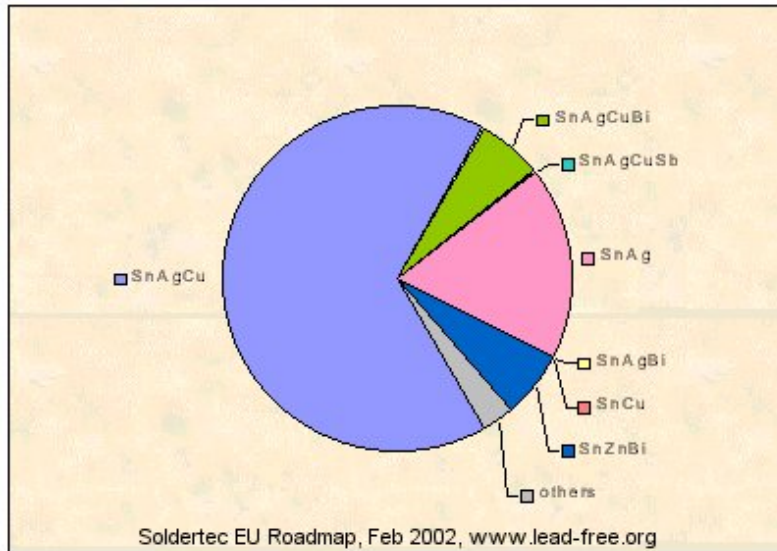
Thank you

www.isq.pt

Reflow

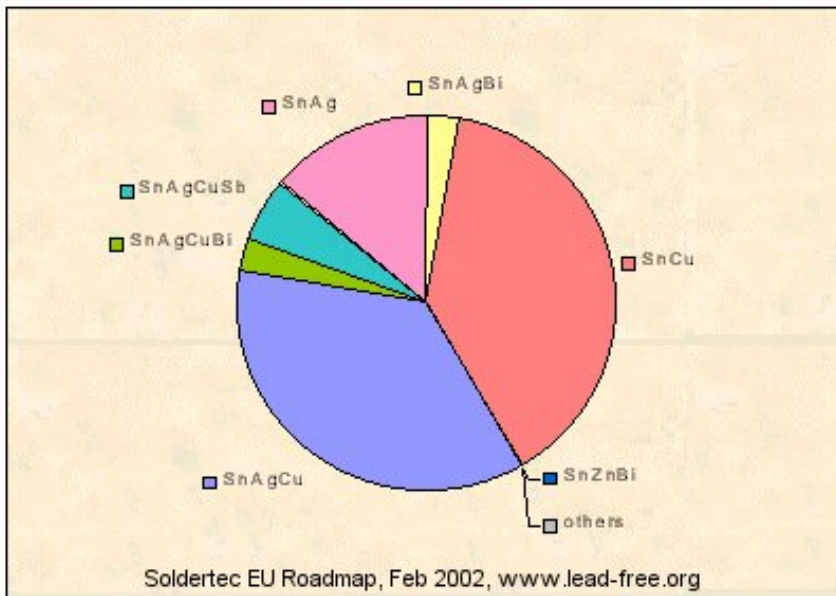


Hand

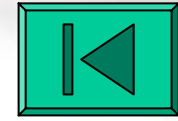


Wave

*Soldertec Courtesy
LFS Road-Map (Feb. 2003)*



EQUIPMENT



REFLOW

- Seems to be easier to adapt (>5-6 thermal zones)

WAVE

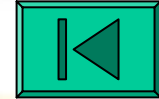
- Most of the cases leads to refurbishment or replacement of Pots
- LF Solders and Pot Corrosion – Coatings required

MANUAL

- New tools and procedures.



TRAINING



- **ON-JOB TRAINING**

Continuous training

- **e-TRAINING** (Concept Anytime, Anywhere)

- SMEs Advantages

- Time flexibility
 - Easy access to knowledge and motivating
 - Cost reduction

